the profiles of the endoplasmic reticulum in intact cells" (Palade & Siekevitz, 1955, p. 178). Noting that some of the microsomes contained small dense particles attached to the outside of their limiting membrane, they argued for identifying microsomes with the rough endoplasmic reticulum. They further commented that preparing the homogenate appeared to cause "an extensive fragmentation of the networks into independent vesicles, tubules, and cisternae, which subsequently can be centrifuged down, together with other cell components, into the homogenate pellets" (p. 179). There was no evidence of a tearing of the membrane, leading them to infer that the fragments "'heal' easily" or, more likely, are formed by a "'spontaneous,' generalized pinching-off process" (p. 192). Palade and Siekevitz concluded that Claude was correct in treating the microsomes as preformed components of the cytoplasm, but wrong to think of them originally as independent particles – rather, they are parts of a "continuous, cell wide system; i.e., the endoplasmic reticulum" (p. 190). This identification provided a bridge between the biochemical investigations of microsomes and the electron microscopy studies of the endoplasmic reticulum and its particles.

Once the homogenate had been centrifuged into microsomal pellets, Palade and Siekevitz found "membrane-bound profiles of approximately the same size and shape as the profiles found in homogenate pellets and considered to be derived, by extensive fragmentation, from the endoplasmic reticula" (p. 179). They observed that particles were still attached to many of the membranes, although they were "slightly less numerous" than in the homogenates, a factor that led them to try to fractionate further the microsomal supernatant in order to isolate the particles. They failed with liver preparations but were more successful in pancreas preparations, where the resulting particles exhibited high RNA and protein content but very low phospholipid content. They had greater success treating the microsomal fraction chemically – deoxycholate treatment eliminated the membrane, leaving the particles, while versene treatment and ribonuclease treatment eliminated the particles, leaving the membrane. From this, they conclude that the RNA is found in the particles and that the protein, phospholipids, and other components associated with microsomes are found in the membrane.

A further consideration in identifying RNA with the particles was that in many cell types the particles often appeared independently of the endoplasmic membrane. Especially in developing cells in intestinal epithelium, whose cytoplasm stains broadly with basic dyes, Palade reported finding "numerous free particles evenly and randomly distributed throughout the cytoplasmic matrix." In contrast, "the endoplasmic reticulum is represented by only a few vesicles and tubules, many of them free of attached particles, and relatively